MISCELLANEOUS APHID NOTES, CHIEFLY FROM OREGON

BY H. F. WILSON

Unless otherwise stated, the types of the new species described in these Notes are in the private collection of the author.

I. LIFE HISTORY NOTES ON PROCIPHILUS FRAXINIDIPETALAE ESSIG[1]

That the Pemphiginids in the genus *Prociphilus* and feeding on ash have the conifers for their alternate food plants, was demonstrated in Europe a number of years ago. In the fall of 1909, the writer, in an attempt to trace a winged aphid which was flying through the air in great numbers at Washington, D. C., located them on the roots of the white pine, *Pinus strobus*, and as this species was later found to develop on *Fraxinus* sp.,[2] the writer was able to work out the relationship of the present species on *Fraxinus oregona* Nuttall and *Pseudotsuga taxifolia* (Poir) Brit., in Oregon.

Each spring there appears on the leaves of the ash a purplish globose aphid which causes the leaves to curl and assume a gall-like formation. Inside the curled leaves these early spring forms, the stem mothers, produce alive a number of young greenish aphids which become mature pupae about the last of May, and attaining wings, usually disappear about the first week in June. These winged forms supposedly[3] go to the roots of Douglas fir and

[1] In Europe there are two similar Pemphiginids on ash; owing to a lack of sufficient material, the author is unable at this time to compare the American species with European forms; but as there seems to be practically no distinguishing characters between them, the American species may prove to be the same as those in Europe.

[2] This species was later described as *P. venafuscus* by Dr. Edith M. Patch, Entomologist of the Maine Experiment Station.

[3] The writer has tried for three years to colonize the alate form from the ash on Douglas fir for seedlings, but without success. The migratory forms from this latter plant have been transferred to ash seedlings with the successful production of eggs and the stem mothers the following spring.

produce alive a number of pale whitish young, which develop into apterous viviparous females and are the first of a series of summer generations.

In the fall, part of the aphids then present on the roots migrate to the ash and produce alive the sexual forms. Those remaining do not acquire wings but continue feeding, and one can find these apterous viviparous forms present on the roots in all stages throughout the year. The sexual forms are minute, brownish, and have no mouth parts. After copulation, each female produces a single elongate egg. In this stage the insect is carried over the winter on the ash.

A second species which has been imported into this state (Oregon) on red and white ash, the writer is calling *Prociphilus bumeliae* Schrank. This species seems to be entirely distinct from the first species, in that it feeds on the tips of the shoots and does not ordinarily get on to the leaves. The stem mothers of the two are quite similar, but the migratory forms show a decided difference in several ways. A description of the various stages of *Prociphilus fraxini-dipetaliae* Essig follows:

Stem mother: Globose, body nearly as wide as long. General color chocolate brown and mottled with green above. Sutures between body segments dark green. Head and legs black, antennae black at the base, light brown toward the tip. Each eye is composed of three smaller eyes. The wax plates on the head are very variable in that the two larger ones at the base of each section of the occiput oftentimes merge into one long plate, the smaller ones varying in number from five to six, and apparently without regular size or position. Those on the body are in series of six to each segment and are more or less regular in position.

Measurements: Length of body, 4 mm.; width, 2.75 mm. Length of antennal segments, I, 0.09 mm.; II, 0.11 mm.; III, 0.176 mm.; IV, 0.11 mm.; V, 0.09 mm.; VI, 0.135 mm.; spur, 0.05 mm.; total length, 0.75 mm.

Pupa: General color lemon yellow, except the wing pads which are dusky. The entire body above is covered with long waxy white threads which have a blue tinge. When they are about ready to change to alate forms, they become a littler darker in color with occasional pinkish and bluish variations. Each abdominal segment with a row of six oblong wax plates. Cauda, short and broad, rounded at the tip. Color black to dusky. Length of body, 3 to 4 mm.; width, 2 mm.

Spring migrant (Plate V, fig. 1): General color bluish green with the entire body pulverulent. The legs, antennae and thorax are bluish black; the abdomen is dark greenish blue. On account of the fact that the waxy threads on the body of the insect are easily rubbed off, it is hard to tell just how much of this

material should be present, but in all specimens examined, only long threads were found along the sides and at the tip of the abdomen. The wax plates are apparently limited to two on the head at the base of the occiput, four on the prothorax, two at the top and center and one on each side, and two large plates on the mesathorax, one on each side of the median line, and at the base of the segment. The wings are hyaline with the stigma dusky at the thinner portion to black at the thicker.

Measurements: Length of body, 3.8 mm.; width, 1.8 mm. Length of antennal segments: I, 0.066 mm.; II, 0.09 mm.; III, 0.49 mm.; IV, 0.242 mm.; V, 0.3 mm.; VI, 0.3 mm.; spur, 0.066 mm.; wing expanse, 11 mm.

Apterous viviparous female: On roots of Douglas fir. General color white with a dusky tinge; head, antennae and cauda dusky to nearly black. Wherever they have been feeding, the bark and earth have a bluish tinge. Head with four pairs of wax plates, sometimes the center plate is absent and the two basal plates are merged into one long plate. Antennae and legs set with numerous short hairs. Fifth segment with one small sensoria at the distal end.

Measurements: Length of body, 2 mm.; width, 1.5 mm. Length of antennae by segments: I, 0.066 mm.; II, 0.11 mm.; III, 0.12 mm.; IV, 0.135 mm.; V, 0.2 mm.; VI and spur, 0.176 mm.

Fall migrant (Plate V, fig. 2): General appearance, wings smoky; head and thorax bluish black; abdomen bluish green, covered with a heavy coating of white waxy threads. Antennae and legs dusky. Antennae with six segments, the spur being but a thumb-like projection. The third segment with 21 to 24 transverse sensoria; fourth with 8 to 12; fifth with 6 to 11; sixth with 3 to 6. Abdomen spindle shaped and with a row of 7 or 8 nipple-like protuberances along each side. Cauda short and bluntly angled at the tip. Anal plate broad and slightly rounded.

Measurements: Length of body, 2.25 mm.; width, 0.9 mm.; wing expanse, 8.5 mm. Length of antennae by segments: I, 0.066 mm.; II, 0.09 mm.; III, 0.38 mm.; IV, 0.22 mm.; V, 0.242 mm.; VI, 0.176 mm.; spur, 0.045 mm.; total length, 1.219 mm.

Sexual forms: The sexual forms are minute, light brown and the only development which takes place after birth may be a single molt, as reported from other related species. Both sexes are without mouth parts and each female develops but a single egg. Copulation apparently takes place shortly after birth and both males and females live but a short time. The males are broader and shorter than the females and the body segments are more distinct. The antennae have fine hairs in both cases.

Measurements: Males—Length of body, 0.56 mm.; width, 0.31 mm.; antennae, 0.22 mm. Females—Length of body, 0.71 mm.; width, 0.242 mm.; antennae, 0.242 mm.

The eggs are light brown when first deposited and later turn brownish black.

II. THE APHIDIDAE INFESTING SAGE BRUSH (*ARTEMESIA SPP.*) IN OREGON

Nine species of aphids have heretofore been described as new from the various species of *Artemesia* in America. Of these at least seven are found in Oregon. Six additional species are here recorded and it is possible that two of these, *Microsiphum oregonensis* and *Aphis hermistonii*, may prove to be Western forms of *M. canadensis* Williams and *Aphis canae* Williams. A key to the Oregon species is included below:

I. Nectaries less than four times as long as wide. II.
Nectaries more than four times as long as wide. V.

II. Body with specialized setae. III.
Body without specialized setae. IV.

III. Specialized setae broadly fan-like at tip. Nectaries shorter than width.
Chaitophorus tridentatae new species
Specialized setae narrowly fan-like at tip. Nectaries twice as long as broad.
Microsiphum oregonensis new species

IV. Setae pointed at tip. Nectaries as broad as long.
Color green. **Microsiphum canadensis** (Williams)
Color red or brown. **Microsiphum artemesiae** (Gillette)

V. Antennae shorter than the body. VI.
Antennae longer than the body. IX.

VI. Body with specialized setae (fan-like at tip). VII.
Body without specialized setae (pointed at the tip). VIII.

VII. Nectaries cylindrical and straight, mouth enlarged.
Aphis frigidae Oestlund
Nectaries curved and slightly clavate, held close to the body.
Aphis tridentatae new species

VIII. Color of body dark green.
Aphis hermistonii new species
Color of body shining wine red.
Aphis artemesicola Williams
Color of body brown.
Third antennal segment with numerous small sensoria.
Aphis reticulata new species
Third antennal segment with less than ten large sensoria.
Aphis oregonensis new species

IX. Body covered with specialized setae. (Fan-like at tip.)
Macrosiphum artemesicola Williams
Body covered with capitate setae.
Macrosiphum frigidae Oestlund
Body covered with pointed setae.
Macrosiphum ludovicianae Oestlund

Chaitophorus tridentatae new species (Plate VI, figs. 22 to 25.)

Found throughout eastern Oregon on *Artemesia tridentata.* This species is not always easy to locate on account of the similarity in color of the body to that of the plant. The entire body is covered with specialized setae which are fan shaped at the tip. These give the appearance of fine white hairs or powder. Most of the individuals are found in rows, one behind the other on the leaves. A good many are found in around the base of the leaf and flower stems.

Apterous viviparous female: General color, light green with more or less of a powdery appearance. Abdomen with a darker green line along the center. Antennae dusky at the tip and shading to light green at the base. Legs with tarsi black; remaining parts and the cauda dusky. Body covered with specialized setae which are broadly fan shaped at the apex. Nectaries not much more than pores and hardly distinguishable among the specialized setae. Antennae shorter than the body and without distinct tubercles. First antennal segment strongly gibbous and with two or three specialized setae, one of which is found at the apex of the segment. Second segment with one, third with four, fourth with two and fifth and sixth without setae. Legs have no specialized setae. Cauda slightly ensiform and not visible from above. Nectaries so short that shape and size cannot be definitely settled with material at hand.

Measurements: Length of body 1.38 mm.; width 0.67 mm. Length of antennal segments: III, 0.154 mm.; IV, 0.11 mm.; V. 0.135 mm.; VI, 0.11 mm.; spur, 0.154 mm.; length of cauda, 0.11 mm.

Alate viviparous female: Light green in color as in apterous form. Head and thorax light brown. Antennae black at the tip and shading to light green at the base. Legs light green with tips of the tibiae and the tarsi black. Cauda light green, nectaries invisible. Entire body covered with specialized setae as in the apterous form. Third antennal segment with 4 or 5 large sensoria, wings long and slender, venation normal. Cauda rounded and tapering at the tip.

Measurements: Length of body, 0.88 mm.; width, 0.30 mm. Length of antennal segments: III, 0.22 mm.; IV, 0.135 mm.; V, 0.176 mm.; VI, 0.135 mm.; spur, 22 mm. Length of cauda, 0.09 mm.; length of wing, 1.84 mm.; width, 0.71 mm.

Microsiphum canadensis (Williams) (Plate VI, figs. 1 to 7.)

Cryptosiphum canadensis (Williams).[4]

Except for a difference in color there is practically no difference between this species and *M.* (*Chaitophorus*) *artemesiae* Gillette. *M. oregonensis* differs from the latter in the specialized setae, so that there is a possibility that these species may be only different forms of the same species.

Apterous viviparous female: General color pale green. Antennae deep black at the tip and through segments 4 to 6; third segment dusky at the distal end and shading to light green at the base. Legs with the tarsi and tips of the tibiae and femora black, the other parts dusky. Body globular and broadly ovate from above; sparsely set with heavy blunt setae. Antennae as long as the body and on semi-distinct tubercles. Third segment with one large sensoria near the base (notes from type slide in U. S. Nat. Museum). Davis[5] has figured this segment with 5 small sensoria; nectaries about as broad as long and tapering. Cauda very short and broad.

Measurements: Length of body, 1.9 mm.; width, 1.22 mm. Length of antennal segments: III, 0.4 mm.; IV, 0.4 mm.; V, 0.2 mm.; VI, 0.11 mm.; spur, 0.55 mm. Length of nectaries, 0.45 mm.; length of cauda, 0.45 mm.

Alate viviparous female: General color, head and thorax dusky or black, abdomen dark green ?, nectaries and cauda dusky to black. Abdomen wide and rounded; tip widely rounded, and not pointed as in other species. Antennae as long as the body, black at the tips and lighter at the base. Antennal tubercles distinct but not extensive. Third antennal segment with from 2 to 4 large sensoria. Wings with normal venation but with veins slightly dusky. Nectaries short, slightly tapering and about as broad as long. Cauda triangular and acute at the tip.

Measurements: Length of body, 1.45 mm.; width, 0.9 mm. Length of antennal segments: III, 0.33 mm.; IV, 0.27 mm.; V, 0.27 mm.; VI, 0.135 mm.; spur, 0.622 mm. Length of nectaries; length of cauda 0.066 mm.; length of wing, 2.1 mm.; width, 0.84 mm.

Microsiphum artemesiae (Gillette) (Plate VI, figs. 8 to 16.)

Chaitophorus artemesiae Gillette.[6]

Collected on *Artemesia tridentata* at Salisbury, Oregon, July 26, 1914.

Apterous viviparous female: General color wine red and shining. In this case not brownish black as in the original description. Antennae black at the

[4] "The Aphididae of Nebraska," University of Nebraska Studies, X, no. 2, p. 89.

[5] Williams, "The Aphididae of Nebraska," a critical review, *ibid*, XI, no. 3, July 1911, plate I.

[6] Ent. News, XXII, p. 443, 1911.

tips, shading to opaque yellow at the base. Legs black except the basal portions of the tibiae and tarsi which are yellow. Nectaries and cauda concolorous with the body. Antennae as long or slightly longer than the body. Antennal tubercles semi-distinct. Third antennal segment with 1 or 2 large sensoria. Abdomen globose; nectaries as broad as wide and slightly tapering. Cauda short and triangular. Body covered with thick, pointed setae.

Measurements: Length of body, 1.75 mm.; width, 1 mm. Length of antennal segments: III, 0.51 mm.; IV, 0.38 mm.; V, 0.34 mm.; VI, 0.066 mm.; spur, 0.69 mm. Length of cauda and nectaries cannot be determined in specimens at hand.

Alate viviparous female: General color, head and thorax black with a reddish tinge. Abdomen shining brownish red. Antennae black at the tip, yellowish at the base. Legs, except base of tibiae and femora, black. Nectaries and cauda concolorous with the body. Wings with stigma and veins dusky; antennae reaching to the tip of the abdomen and the third segment with as many as 10 large sensoria, although Gillette only gives 4. The number apparently varies considerably, since I have found some specimens sent me by Mr. L. C. Bragg with six sensoria.

Measurements: Length of body, 1.44 mm.; width, 0.84 mm. Length of antennal segments; III, 0.51 mm.; IV, 0.38 mm.; V, 0.35 mm.; VI, 0.135 mm.; spur, 0.67 mm. Length of nectaries ?; length of cauda 0.066 mm.; length of wings, 2.58 mm.; width, 1 mm.

Microsiphum oregonensis new species? (Plate VI, figs. 17 to 21.)

Found on *Artemesia tridentata* at Salisbury, Oregon, July 26, 1914. That two species of such similar and unusual characters should exist on the same host in the same locality is more or less open to question, but the present species is questionably described as new on the fact that the setae of the individuals here included are entirely different from those of the preceding species, and while the nectaries are more or less similar there is still a distinct difference. The alate form has not been taken.

Apterous viviparous female: General color light wine red, with a more or less shining or metallic appearance. Antennae and legs dusky red except the basal half of the former and the tibiae of the latter. Body globose, oval from above, and sparsely set with long curved specialized setae each of which bears a flat fan-shaped tip. Antennae as long as the body. Antennal tubercles semi-distinct. Third segment with a single large sensoria near the base. First, second and third segments with spines similar to those on the body. On the third segment these are all on one side. Nectaries twice as long as broad and slightly tapering. Cauda short, broad and blunt.

Measurements: Length of body, 1.66 mm.; width, 0.88 mm. Length of antennal segments: III, 0.31 mm.; IV, 0.3 mm.; V, 0.27 mm.; VI, 0.11 mm.; spur, 0.49 mm. Length of nectaries, 0.066 mm.; length of cauda, 0.066 mm.

Aphis reticulata new species (Plate VII, figs. 1 to 7.)

On *Artemesia tridentata*, Klamath Falls, Oregon, July 9, 1914, and in company with *M. frigidae* Oestlund.

Apterous viviparous female: General color brown. Antennae black at the tip and shading to dusky at the base of the third segment. Segments one and two brownish opaque. Legs dark brown except at the base of the femora; nectaries and cauda dark brown to black. The important character of this species is the reticulation found over the entire body. The structure of the outer sheath of the antennae is unusually different in that it seems to be made up of numerous small ridges which gives an additional opaqueness and after clearing they can hardly be seen through. Antennae not quite as long as the body and on slight tubercles. The nectaries slightly tapering and slightly curved inward, no reticulations are found at the tip. Thorax bears a single finger-like tubercle on each side and the abdomen with others, a large pair just back of the thorax. Cauda slightly more than half as long as the nectaries and tapering to a blunt rounded point.

Measurements: Length of body, 1.72 mm.; width, 0.88 mm. Length of antennal segments: III, 0.49 mm.; IV, 0.24 mm.; V, 0.2 mm.; VI, 0.11 mm.; spur, 0.33 mm. Length of nectaries, 0.49 mm.; length of cauda, 0.18 mm.

Alate viviparous female: General color of head, thorax, antennae and legs, black. Abdomen dark brown. Antennae reaching to the base of the nectaries, third segment with about 40 irregular, raised sensoria. Ocular tubercles unusually prominent. Prothorax with a single finger-like tubercle on each side. Abdomen with tubercle above base of hind pair of legs. Nectaries reaching beyond the tip of the cauda, cylindrical and tips slightly bent outward and downward. Cauda tapering, curved upward and blunt at the tip.

Measurements: Length of body, 1.5 mm.; width, 0.58 mm. Length of antennal segments: III, 0.4 mm.; IV, 0.2 mm.; V, 0.22 mm.; VI, 0.11 mm; spur, 0.35 mm. Length of nectaries, 0.31 mm.; length of cauda, 0.154 mm.; length of wings, 3.1 mm.; width, 1.04 mm.

Aphis oregonensis new species (Plate VII, figs. 8 to 17.)

Collected at Klamath Falls, Oregon, July 8, 1913, on *Artemesia tridentata.*

A peculiar condition of the plant was found in connection with each colony of this species. In every instance the stem of the plant had been broken and bent over. There were indications present that some insect had almost eaten away the stem at that point.

Apterous viviparous female: General color, greyish brown tinged with wine red. Nectaries with the first four and the basal half of the fifth segments yellow, remaining parts black. Legs, except the tip of the tibiae and the tarsi, yellowish; rest black. Nectaries and cauda black. Antennae about one-half the length of the body. Prothorax with a single blunt tubercle. Abdomen

broadly oval, pointed at the tip and with a row of 4 or more blunt tubercles along the side of the abdomen. Nectaries slightly tapering and curved; cauda short, broad at the base and tapering to a rounded tip.

Measurements: Length of body, 1.71 mm.; width of body, 1.11 mm. Length of antennal segments; III, 0.242 mm.; IV, 0.22 mm.; V, 0.176 mm.; VI, 0.135 mm.; spur, 0.242 mm. Length of nectaries, 0.42 mm.; length of cauda, 0.09 mm.

Alate viviparous female: General color of head and thorax black; abdomen greyish brown tinged with wine red. Antennae dusky yellow at base, black at the tip. Legs with middle of tibiae and femora dusky yellow; remaining parts black. Nectaries dusky red; cauda yellowish at the base, black at the tip. Antennae reaching to the base of the nectaries, third segment with 4 or 5 large sensoria. Prothorax with a single finger-like tubercle at the base of each side. Just back of that and apparently between the prothorax and the mesathorax on each side is a larger and broader tubercle or hump. Abdomen with a number of large tubercles along the side, two of which are finger-like projections one on each side midway between the nectaries and the cauda. Wing venation normal, nectaries tapering, smaller at the base than at the tip and reaching to the base of the cauda. Cauda short and tapering, tip bluntly rounded. Caudal plate broad and slightly rounded.

Measurements: Length of body, 1.34 mm.; width, 0.67 mm. Length of antennal segments: III, 0.242 mm.; IV, 0.154 mm.; V, 0.154 mm.; VI, 0.11 mm.; spur, 0.176 mm. Length of nectaries, 0.198 mm.; length of cauda, 0.11 mm. Length of wing, 2.22 mm.; width, 0.33 mm.

Aphis hermistonii new species (Plate VII, figs. 18 to 25.)

First taken at Hermiston, Oregon, 1912; later taken at Klamath Falls and other points in eastern Oregon. Found on *Artemesia tridentata.*

Apterous viviparous female: General color dark green, body flecked with patches of whitish powder. Antennae dusky yellow at the base, black toward the tip. Legs, nectaries and cauda dusky to black. Antennae not quite reaching to the base of the nectaries. Third segment with one sensorium and this is lacking in a great many individuals. Prothorax with a single well developed finger-like tubercle on each side. Abdomen with four large tubercles, two on each side. The first two are found one on each side of the abdomen near the thorax. The other two are found half way between the nectaries and the base of the cauda. Nectaries cylindrical with the tip much broader than the nectary proper. Cauda short and tapering.

Measurements: Length of body, 1.35 mm.; width, 0.777 mm. Length of antennal segments: III, 0.176 mm.; IV, 0.154 mm.; V, 0.156 mm.; VI, 0.11 mm.; spur, 0.18 mm.; length of nectaries, 0.35 mm.; length of cauda, 0.66 mm.

Alate viviparous female: General color head and thorax black; abdomen dark green with scattered spots of white powder; antennae, legs, nectaries and cauda dusky or black with a greenish tinge. Antennae not quite reaching to the base of nectaries. Third segment with 4 or 5 large sensoria. Prothorax with tubercles as in the apterous form and abdomen with a single large

tubercle on each side just behind the metathorax. Nectaries thicker at the base and at the tip than in the middle. Flange at the tip broadest part of nectaries. Cauda short, tapering and turned upward.

Measurements: Length of body, 1.2 mm.; width, 0.5 mm. Length of antennal segments: III, 0.198 mm.; IV, 0.11 mm.; V, 0.135 mm.; VI, 0.01 mm.; spur, 0.176 mm. Length of nectaries, 1.54 mm.; length of cauda, 0.05 mm.; length of wing, 1.62 mm.; width, 0.67 mm.

Aphis tridentatae new species (Plate VII, figs. 26 to 30.)

Found in company with *M. artemesiae* Boyer and *Ch. tridentatae* during May and June.

This species resembles *Ch. tridentatae* on the plants and the only distinction is the wider body and pinkish color of some individuals. Under the microscope the spines are found to be different and the presence of well developed nectaries readily separates this species from the other. There is no present genus into which this species can be placed so it is deemed best to designate it as an *Aphis* for the time being.

Apterous viviparous female: General color light pink or white, covered with numerous white fan-like specialized setae. Antennae black at the tip shading to dusky at the base; legs dusky at the tip of the femora and tibiae and the tarsi black. Head slightly convex, abdomen obovate, caudal end broadly rounded, cauda not apparent from above, very short and rounded. Antennae slightly longer than one-half the body and antennal tubercles present as ridges. Antennae without specialized setae. Legs sparsely set with setae like those on the body but not quite so heavy. Eyes hardly tuberculate. Nectaries curved and clavate with the tip cut obliquely. In many individuals the nectaries cling so closely to the body that they cannot be seen.

Measurements: Length of body, 1.54 mm.; width, 0.8 mm. Length of antennal segments: III, 0.14 mm.; IV, 0.135 mm.; V, 0.135 mm.; VI, 0.11 mm.; spur, 0.22 mm. Length of nectaries, 0.22 mm.; length of cauda, 0.45 mm.; length of specialized setae, 0.045 mm.

Alate viviparous female: General color pink or light green with light brown head and thorax. Antennae black at the tip and shading to light or dusky green at the base. Legs with femora light, tibiae dusky and tarsi black. Cauda light green. The spines are not nearly as numerous as in the apterous forms but they are sparsely found over the entire body and on the legs. Those on the legs are much finer than those on the body. Antennae normally nearly as long as the body and rather slender. Third segment with 4 round sensoria placed as in drawing. Wings long and slender, venation normal. Nectaries as in the apterous form. Cauda almost cylindrical and extending slightly beyond the tip of the abdomen.

Measurements: Length of body, 1 mm.; width, 0.35 mm. Length of antennal segments: III, 0.2 mm.; IV, 0.176 mm.; V, 0.154 mm.; VI, 0.09 mm.; spur,

0.27 mm. Length of nectaries, 0.22 mm.; length of cauda, 0.066 mm.; length of wing, 2.22 mm.; width, 0.67 mm.

Aphis frigidae Oestlund [7] (Plate VIII, figs. 20 to 24.)

Found in company with *M. frigidae* Oestlund on *Artemesia tridentata* throughout the eastern part of Oregon.

General color dark brown with a greenish tinge which is not at first evident on account of a general light colored appearance produced by a coating of fine white powder. In the original description of this species Oestlund speaks of "a rather thick pubescence of fine and short hairs" which I have been unable to discover. The entire body is, however, covered with long curved hairs having flared tips. Antennae black except at the base of the third and the first and second segments. Legs, nectaries and cauda dusky to black. The antennae are as long as the body and are not mounted on antennal tubercles. Head nearly straight in front, eyes black and with ocellus weak or entirely wanting. Abdomen oval and round and curved with numerous light spots which are the tubercles from which the hairs originate. The nectaries form one of the most important specific characters of this species. They are cylindrical throughout and the tip is widened out to twice the width of the main part. Cauda short and rounded at the tip.

Measurements: Length of body, 1.6 mm.; width, 0.78 mm.; length of antennal segments: III, 0.25 mm.; IV, 0.23 mm.; V, 0.22 mm.; VI, 0.11 mm.; spur, 0.42 mm. Length of nectaries, 0.42 mm.; length of cauda, 0.12 mm.

Aphis artemesicola Williams [8] (Plate VIII, figs. 16 to 19.)

What is believed to be this species was taken on *Artemesia tridentata* in company with *M. canadensis* Williams at Salisbury, Oregon, July 26, 1914. Only the apterous forms were taken but the specimens agree fairly well with Williams' description. The number of sensoria on the third antennal segment do not, however, correspond with those shown by Davis in his critical review of Williams' species.[9]

General color shining wine red; antennae about two-thirds the length of the body. Antennal segments one, two and the greater part of three dusky yellow; remaining parts deep black. Legs black except at base of femora and the basal half of the tibiae. Nectaries black; cauda black at tip, dusky red toward base. Antennae with from 2 to 8 sensoria on the third segments, mostly 2 to 4. Nectaries slightly tapering and each one with about four hairs; tip flanged. Cauda short and broad at the base, and pointed at the end. Body with pointed hairs.

[7] Fourteenth Annual Rept. Geol. and Nat. Hist. Surv. Minn., 1886, p. 46.

[8] "The Aphididae of Nebraska," University of Nebraska Studies, X, no. 2, p. 37.

[9] Loc. cit.

Measurements: Length of body, 1.21 mm.; width, 1.154 mm. Length of antennal segments: III, 0.44 mm.; IV, 0.33 mm.; V, 0.27 mm.; VI, 0.135 mm.; spur, 0.49 mm. Length of nectaries, 0.15 mm.; length of cauda, 0.11 mm.

Macrosiphum artemesicola Williams[10] (Plate VIII, figs. 11 to 15.)

On *Artemesia vulgaris* at Corvallis, Oregon, July 2, 1911.

General color pale green and appearing as if covered with minute particles of fine white powder. This appearance is in reality due to numerous capitate hairs which cover the entire body but are not found on the appendages. This species is a very active one and may be found in company with *M. ludovicianae* on the above host on the stems and leaves, mostly on the former.

Apterous viviparous female: General color light green and almost identical with that of the food plant. Antennae black except the first and second and basal parts of the third segments. Legs dusky to black except the basal part of the tibiae and femora. Nectaries black. Cauda dusky. Antennae long and slender and reaching beyond the nectaries and cauda. Each antennal tubercle with a single capitate hair at its apex. First antennal segment strongly gibbous on the inner side. Third segment with two visible sensoria near the base, fifth with one near the distal end and sixth with the usual number at the base of the spur. The entire body is thickly set with toadstool-like setae of which there appears to be two forms. They are in reality about the same size and shape except that those on the head and at the base of the cauda have a longer stem than those on the rest of the body. The antennae are very sparsely set with fine short hairs. The same is true of the femora and while there are a greater number on the tibiae they are not as numerous as in the previous species. The hairs on the cauda and caudal plate are rather sparse and are longer than those on the legs and antennae. Nectaries slender and slightly tapering. Cauda ensiform and rounded at the tip. The outer surface of the latter seems to be made up of fine short pointed scales.

Measurements: Length of body, 1.73 mm.; width, 0.88 mm. Length of antennal segments: III, 0.58 mm.; IV, 0.49 mm.; V, 0.49 mm.; VI, 0.11 mm.; spur, 0.75 mm. Length of nectaries, 0.44 mm.; length of cauda, 0.154 mm.

Alate viviparous female: General color of head and thorax dusky brown or black; abdomen similar in appearance to that of apterous form. Antennae black at the tip shading to light green at the base. Legs dusky green at distal end of tibiae and femora, lighter at base; tarsi black. Nectaries and cauda dusky to black. Antennae longer than the body. Antennal tubercles strong and each with three capitate hairs, center of forehead with two. First antennal segment strongly gibbous and without hairs or bristles. Third segment with about 14 round sensoria on the outer side of the segment, fourth apparently with none, the fifth with one and the sixth normal. Wings hyaline but with dark veins. Nectaries more slender than in the apterous form and thicker at the base and tip than in the middle. Cauda tapering and with a broadly rounded tip.

[10] "The Aphididae of Nebraska," University of Nebraska Studies, X, no. 2, p. 73.

Measurements: Length of body, 2.11 mm.; width, 0.95 mm. Length of antennal segments: III, 0.86 mm.; IV, 0.75 mm.; V, 0.73 mm.; VI, 0.154 mm.; spur, .122 mm. Length of nectaries, 0.644 mm.; length of cauda, 0.154 mm.; length of wing, 3.11 mm.; width, 1.11 mm.

Macrosiphum artemesiae Boyer[11] (Plate VIII, figs. 6 to 10.)

Siphonaphora frigidae Oestlund.[12]
Nectarophora artemesiae Cowen.[13]
Nectarophora coweni Hunter.[14]

This species is found in all sections of Oregon where *Artemesia tridentata* grows. It has been collected in a very isolated patch of this plant on top of Grays Peak, Grant County, Oregon, elevation about 7000 feet. It apparently does not occur in the Willamette valley. Two forms of this species are generally found, one a dark shining green and the other a light moss green. Both forms are found together on the same plant, and in late July colonies of the lighter form may be found separate from the others. The following description is made from the dark form:

Apterous viviparous female: General color dark metallic green; legs and antennal black except the basal parts of the femora, and the first, second and a part of the third antennal segments. Eyes, nectaries and cauda black. Antennae longer than the body, third segment with from six to nine irregular round sensoria. Nectaries long, stout, tapering, and reaching beyond the tip of the cauda. Each nectary with about four capitate setae. Cauda long, heavy, broadly pointed and ensiform. Nectaries reticulated for a very short distance back of the tip. The chief character of this species is the capitate hairs which are found sparsely over the body.

Measurements: Length of body, 2 mm.; width, at widest part of abdomen, 1.25 mm. Length of antennal segments: III, 0.74 mm.; IV, 0.6 mm.; V, 0.5 mm.; VI, 0.154 mm.; spur, 0.8 mm. Length of nectaries, 0.73 mm.; length of cauda, 0.30 mm.

Alate viviparous female: General color, head and thorax shining black. Abdomen shining dark green. Antennae except base of third segment and legs except base of femora black; eyes, nectaries and cauda also black. Antennae longer than the body and on strong gibbous tubercles. Third segment with 11 to 15 visible round irregular sized sensoria, fourth with about seven and fifth and sixth with usual number. It is impossible to make out all of the sensoria on the third and fourth segments without clearing. Wing venation

[11] Ann. Soc. Ent. France, X, p. 162, 1841.

[12] Fourteenth Ann. Rept. Geol. and Nat. Hist. Survey Minn., 1886, p. 20.

[13] Colo. Agl. Exp. Sta. Bull. 31, Tec. Ser. 1, p. 123, 1895 (Mr. L. C. Bragg writes me that Cowen's species is the same as that of Oestlund.)

[14] Iowa Ex. Sta. Bull. 60, 1901, p. 114, A new name for *N. artemesiae* Cowen, which is preoccupied.

normal. Nectaries thick, long and almost cylindrical but with a slight taper. They reach to about the tip of the cauda, which is similar in shape to that of the apterous form.

Measurements: Length of body, 2 mm.; width, 0.9 mm. Length of antennal segments: III, 0.75 mm.; IV, 0.51 mm.; V, 0.47 mm.; VI, 0.154 mm.; spur, 0.75 mm. Length of nectaries, 0.52 mm.; length of cauda, 0.27 mm.; length of wing, 4 mm.; width, 1.34 mm.

Macrosiphum ludovicianiae Oestlund (Plate VIII, figs. 1 to 5.)

Collected at Corvallis, Oregon, July 2, 1911. On *Artemesia vulgaris* and on the same plant at Salisbury, Oregon, July 26, 1914. A very large greyish green species feeding mostly on the stems.

Apterous viviparous female: General color pale green, entire body covered with a fine white powder, eyes reddish. Antennae longer than the body and black except the first and second segments and the basal half of the third which are dusky. Legs black except the basal part of the femora. Nectaries black and cauda yellow. Third segment of antennae with 9 to 12 visible irregular sensoria, which are more or less roundish in shape. Nectaries and cauda as in the alate form.

Measurements: Length of body, 2.5 mm.; width, 1.1 mm. Length of antennal segments: III, 1.11 mm.; IV, 1.07 mm.; V, 0.86 mm.; VI, 0.3 mm.; spur, 1.25 mm. Length of nectaries, 0.86 mm.; length of cauda, 0.53 mm.

Alate viviparous female: General color light green; abdomen and legs covered with a white powder which gives them about the color of the plants upon which they are found. Eyes red. Antennae deep black except the two basal segments and a part of the third. Legs dusky to black except the basal one-third of the femora which is lighter. Nectaries black, cauda yellowish green. Antennae longer than the body and on strong tubercles. Third segment with about 55 visible sensoria, variable in size and oval to round in shape; the fourth segment apparently has none and the fifth bears one large one near the distal end. Sixth with the usual sensoria at the base of the spur. Nectaries somewhat slender and tapering; thickest at the base and flanged at the tip; the distal half distinctly different in appearance from the basal half on account of the reticulated surface. Cauda nearly as long as the nectaries and shaped like a spear head with the broadest part in the middle.

Measurements: Length of body, 3 mm.; width, 1 mm. Length of antennal segments: III, 1.22 mm.; IV, 1.08 mm.; V, 0.9 mm.; VI, 0.3 mm.; spur, 1.24 mm. Length of wing, 4 mm.; width at widest part, 1.31 mm. Length of nectaries, 0.71 mm.; length of cauda, 0.51 mm.

III. NEW SPECIES OF APHIDS

Amphorophora subterrans new species (Plate IX, figs. 1 to 4.)

Collected on roots of *Dactylis glomerata* Linn. at Corvallis, Oregon, April 6, 1912. Very abundant 6 to 8 inches below the surface of the ground in loose soil. Apterous, alate and pupae forms found.

Apterous viviparous female: General color dark green with a brownish tinge. Antennae black, eyes dark red. Legs yellow except at the tips of femora and tibiae and tarsi, which parts are black. Nectaries and cauda black. Body sparsely set with short hairs. Antennae reaching beyond the tip of the cauda, third segment with two circular sensoria near the base. Nectaries reaching to the base of the cauda and swollen in the middle. Cauda tapering and blunt at the tip.

Measurements: Length of body, 1.95 mm.; width, 1 mm. Length of antennal segments; III, 0.56 mm.; IV, 0.42 mm.; V, 0.3 mm.; VI, 0.135 mm.; spur, 0.67 mm. Length of nectaries, 0.46 mm.; length of cauda, 0.154 mm.

Alate viviparous female: General color head and thorax dark green or black; abdomen moss green with a dorsal dark green spot which is slightly narrower behind. Antennae black; legs dusky or black except femora, which have the basal part dusky yellow. Nectaries black; cauda black at the tip. Antennae longer than the body and on distinct antennal tubercles, third segment with 8 to 11 large circular sensoria. In some species an occasional small sensorium may be found adjacent to one of the larger ones. Body, antennae and femora sparsely set with short hairs. A distinguishing characteristic of this species is found in the ocular tubercles which themselves bear two or three smaller tubercles. Wing venation normal. Nectaries as in the apterous forms and semi-annulated just back of the tip which is strongly flanged. Cauda ensiform and tapering to a blunt tip.

Measurements: Length of body, 1.9 mm.; width, 0.9 mm. Length of antennal segments: III, 0.53 mm.; IV, 0.42 mm.; V, 0.38 mm.; VI, 0.176 mm.; spur, 0.73 mm. Length of nectaries, 0.4 mm.; length of cauda, 0.16 mm.; length of wing, 3 mm.; width at widest part, 1.22 mm.

Macrosiphum mentzeliae new species (Plate IX, figs. 5 to 9.)

Collected on *Mentzelia* at Monclova, Mexico, Nov. 23, 1909. This aphid was sent to me by Mr. F. C. Bishopp of the U. S. Bureau of Entomology. The specimens obtained are in alcohol but from the general light color they must have been of a pale green color. The color markings are not necessary for the easy determination of this species, however, as the entire body, legs and antennae bear short curved, capitate hairs.

Apterous viviparous female: Antennae longer than the body, dark at the tips and rather slender. Third segment with two small sensoria. Abdomen

long and slender. Nectaries reaching beyond the tip of the abdomen and long and slender. Cauda long and unusually broad.

Measurements: Length of body, not including cauda, 1.8 mm.; width, 0.67 mm. Length of antennal segments: III, 0.5 mm.; IV, 0.48 mm.; V, 0.4 mm.; VI, 0.135 mm.; spur, 0.75 mm. Length of nectaries, 0.55 mm.; length of cauda, 0.31 mm.

Alate viviparous female: Antennae reaching beyond the tips of the nectaries, dark at the tips and the third segment with about 10 to 12 round sensoria. Nectaries long and slender and reaching beyond the tip of the cauda. Cauda as in the apterous form.

Measurements: Length of body, 2 mm.; width, 0.75 mm. Length of antennal segments: III, 0.6 mm.; IV, 0.48 mm.; V, 0.4 mm.; VI, 0.135 mm.; spur, 0.8 mm. Length of nectaries, 0.6 mm.; length of cauda, 0.3 mm.; length of wing, 3 mm.; width, 0.9 mm.

Aphis lithospermii new species (Plate IX, figs. 10 to 14.)

A very common species on *Lithospermum pilosum* Nuttall in the southeastern part of Oregon during June and July.

Apterous viviparous female: General color dark green with 4 or 5 black transverse bars on the forepart of the abdomen and one at the base of the nectaries; head black and thorax dusky. Antennae black except at the base, tibia black at the ends and light in the middle. Nectaries and cauda black. Body robust and broadly oval. Nectaries reaching to about one-third the length of the body. Prothorax with one large finger-like tubercle. Abdomen with two tubercles on each side. One pair is found not quite half way from the thorax to the nectaries and the other pair is found between the base of the cauda and the nectaries. Nectaries short, about the same length as the cauda and tapering. Cauda short and tapering to a bluntly rounded tip. Entire body with a sparse pruinose covering.

Measurements: Length of body, 2.1 mm.; width, 1.38 mm. Length of antennal segments: III, 0.3 mm.; IV, 0.134 mm.; V, 0.154 mm.; VI, 0.11 mm.; spur, 0.198 mm. Length of nectaries, 0.176 mm.; length of cauda, 0.176 mm.

Alate viviparous female: General color head and thorax black; abdomen green with three transverse black bands just in front of the base of the cauda. Antennae black except at the base, and legs black except the middle part of the tibiae. Body stout, antennae about half as long as the body; third segment with about 9 to 12 irregular sensoria, and the fourth with two on the distal half of the segment. Thorax apparently without tubercles. Abdomen with two pairs of tubercles as in the apterous form but it is necessary to have the specimen turned slightly sidewise in order to make them out. Nectaries short and tapering and about as long as the cauda, which is short, tapering and with a blunt, rounded tip.

Measurements: Length of body, 1.67 mm.; width, 0.84 mm. Length of antennal segments: III, 0.31 mm.; IV, 0.156 mm.; V, 0.135 mm.; VI, 0.135 mm.; spur, 0.242 mm. Length of nectaries, 0.154 mm.; length of cauda, 0.15 mm.; length of wing, 2.62 mm.; width, 0.95 mm.

Aphis chrysothamni new species (Plate IX, figs. 15 to 18.)

Collected at Salisbury, Oregon, during July, 1912 and 1914, on *Chrysothamnus lanceolatus* Gr. This aphis is very abundant on side hills along the canyons. General color green to red. The young lice are green and the mature forms are red.

Apterous viviparous female: General color: head dark wine red, prothorax a lighter red and segment corresponding to metathorax greyish green; abdomen light green, mottled with darker green and with a large dark green spot in the center of the dorsum; last two segments covered with a greyish powder. In other stages the entire body assumes a pinkish tinge. Other mature forms are wine red mottled with dark green. Antennae light colored at the base, darker toward the tip; nectaries and cauda black. Body broadly ovate. Antennae less than half as long as the body and apparently without tubercles; thoracic segments with two pairs of lateral tubercles, the front pair broad and rounded, the second pair more slender and thumb-like in shape. Abdomen with only one pair of apparent tubercles, which are rather short and are situated between the nectaries and the cauda. Nectaries short and slightly tapering. In some cases they appear very slightly constricted just back of the tip. Cauda very short and broadly pointed.

Measurements: Length of body, 2.35 mm.; width, 1.62 mm. Length of antennal segments: III, 0.33 mm.; 0.242 mm.; IV, 0.198 mm.; V, 0.198 mm.; VI, 0.11 mm.; spur, 0.154 mm. Length of nectaries, 0.242 mm.; length of cauda, 0.1 mm.

Alate viviparous female: General color: antennae, head and thorax black; abdomen green mottled with darker green; legs black with tibiae dusky. Body elongate and broad for its length. Antennae about two-thirds as long as the body, the third segment with 4 to 6 large sensoria in more or less of a straight line with each other; fourth with 4 to 7 sensoria. Wings with veins hairy and dusky. Veins m^1 and m^2 form a fork rather shorter and smaller than usual. Nectaries short and cylindrical. Cauda short, and almost triangular, tip rather sharp.

Measurements: Length of body, 1.55 mm.; width, 0.8 mm. Length of antennal segments: III, 0.33 mm.; IV, 0.242 mm.; V, 0.22 mm.; VI, 0.135 mm.; spur 0.198 mm. Length of nectary, 0.242 mm.; length of cauda, 0.11 mm.; length of wing, 2.22 mm.; width, 0.8 mm.

Macrosiphum pteridis new species (Plate IX, figs. 19a to 19c.)

Found throughout western Oregon on the fronds of *Pteris aquilina* Linn. Very common but disappears almost entirely from open places during heat of summer. Can be found in shaded spots along hillsides at all times.

Apterous viviparous female: General color yellowish white; legs dusky white and antennae white except sixth segment and spur. Body long and medium slender; antennae exceedingly long and slender; nectaries long, slender and

tip curved outward as in *Myzus*. Cauda short and ensiform. Entire body with medium length capitate hairs.

Measurements: Length of body, 2.77 mm.; width, 1.22 mm. Length of antennal segments: III, 1.2 mm.; IV, 0.88 mm.; V, 0.73 mm.; VI, 0.154 mm.; spur, 1.2 mm. Length of nectaries, 1.2 mm.; length of cauda, 0.3 mm.

Alate viviparous female: General color green with the head and thorax orange brown. Antennae black except the first two segments, which are dusky green or brown. Legs with base of femora yellowish, nectaries dusky orange at the tip, green at the base. Cauda green. Antennae long and slender and third segment with from 20 to 26 regular round sensoria in straight alignment. Wing venation normal. Antennae long, slender and with the distal half strongly curved outward. Cauda short and ensiform. Entire body except cauda and nectaries set with short capitate hairs. Cauda and caudal plate with pointed hairs.

Measurements: Length of body, 2.5 mm.; width, 0.9 mm. Length of antennal segments: III, 1 mm.; IV, 0.84 mm.; V, 0.777 mm.; VI, 0.242 mm.; spur, 1.33 mm. Length of nectaries, 0.67 mm.; length of cauda, 0.27 mm.; length of wing, 4.4 mm.; width, 1.66 mm.

Lachnus laricifoliae new species (Plate X, figs. 9 to 14.)

Collected on *Larix occidentalis* in Baker and Grant Counties, Oregon. The apterous forms are rather easy to find but not exceedingly numerous, while the alate forms are scarcer and harder to find. They are for the most part found about the base of the needle clusters.

Apterous viviparous female: General color black with a covering of white powder and with a light streak down the center of the dorsum. The antennae are dusky yellow at the base and black toward the tip. The legs are black except the basal portions of the femora and the center of the tibiae, which are dusky yellow. Cauda black. Body broadly oval and elongate. Antennae reaching to the base of the middle pair of legs and beak reaching to base of hind pair. Nectaries of medium diameter at the base and narrowly tapering to a wide funnel-shaped mouth. Cauda short and broadly rounded at the tip. Entire body, legs, nectaries and antennae covered with hairs.

Measurements: Length of body, 4.23 mm.; width, 2.22 mm. Length of antennal segments: III, 0.73 mm.; IV, 0.27 mm.; V, 0.31 mm.; VI, 0.154 mm.; length of cauda, 0.154 mm.; width at base, 0.42 mm. Length of hind tibiae, 2.22 mm.; length of hind tarsus, 0.35 mm.; length of hind metatarsus, 0.13 mm.

Alate viviparous female: General color black covered with a white powder and with a light streak down the center of the abdomen. Antennae and legs the same as in the apterous form. Head and thorax shining black. Nectaries black, with a large white spot at the base of the nectaries and which does not become conspicuous until the specimens have been put in alcohol. Cauda as in the apterous form. Antennae reaching to the base of the wings and the third segment with from 8 to 11 regular small sensoria; fourth segment with

one or two near the distal end and fifth with two large ones near the distal end. Spur of sixth short and ending in a thick short spine. Wings normal and with the median vein distinct and with two branches. Abdomen with a row of six blunt tubercles on each side. Nectaries and cauda as in the apterous form. Entire body, antennae, legs and nectaries covered with hairs.

Measurements: Length of body, 4.78 mm.; width, 2.1 mm. Length of antennal segments: III, 0.69 mm.; IV, 0.27 mm.; V, 0.35 mm.; VI, 0.135 mm. Length of hind tibia, 3.22 mm.; hind tarsi, first segment, 0.135 mm.; second segment, 0.35 mm.; length of beak, 1.9 mm.; length of wing, 5.33 mm.; width, 2.55 mm.

Lachnus oregonensis new species (Plate X, figs. 1 to 8.)

Collected on *Pinus* sp., Fort Klamath, Oregon, July 6, 1914. Found only on the cones. Alate and apterous forms. Possibly this species extends its feeding to the shoots later in the season.

Apterous viviparous female: General color shining brown, with the dorsum dusky to black. (In balsam immediately after mounting, there appears to be a slight streak down the center of the back with a dark black band extending from the base of the abdomen to the cauda.) Antennae yellowish at the base and black toward the tip. Legs dusky yellow at the base and black toward the tips; cauda black, nectaries black. Body obovate, robust and set with numerous fine hairs. Antennae slender and reaching to the middle of the mesothoracic segment; fifth segment with one or two large sensoria. Legs and antennae set with fine hairs, rather more plentiful on tibiae than on the femora. Nectaries broad and slightly tapering toward the central tube which is flanged at the tip. Cauda broadly rounded. The beak reaches beyond the tip of the abdomen.

Measurements: Length of body, 3 mm.; width, 1.5 mm. Length of antennal segments: III, 0.35 mm.; IV, 0.135 mm.; V, 0.135 mm.; VI, and spur, 0.135 mm. Length of hind tibia, 1.84 mm.; length of hind tarsus, 0.35 mm.; length of hind metatarsus, 0.09 mm.

Alate viviparous female: General color dark brown to black; abdomen with the dorsum of each segment black. Antennae light at the base, shading to black at the tip. Legs dusky yellow at the base of the femora and tibia and black at the tips; tarsi black. Antennae reaching to the base of the wings, the third segment with about 3 to 6 irregular sized round sensoria of medium size; fourth with one or two large sensoria; fifth with two and the sixth with the usual large and small sensoria. Abdomen with a row of fine tubercles along each side and on a line below the nectaries. Nectaries broadly cone-shaped. The beak reaches to the tip of the abdomen or slightly beyond. Wing venation complete. Median vein entire but appearing as an outline.

Measurements: Length of body, 2.4 mm.; width, 1 mm. Length of antennal segments: III, 0.38 mm.; IV, 0.154 mm.; V, 0.2 mm.; VI and spur, 0.154 mm. Length of wing, 3.8 mm.; width, 1.22 mm.; length of hind tibia, 1.86 mm.; length of hind tarsus, 0.4 mm.; length of hind metatarsus, 0.09 mm.; length of beak, 2.58 mm.

Lachnus rubicundus new species (Plate XI, figs. 8 to 14.)

Found on *Juniperus occidentalis* along the dry ridges of eastern Oregon. Specimens not very abundant and would probably escape being seen if it were not for the ants running about over the infested twigs. Only two alate forms taken in a half day's search.

Apterous viviparous female: General color, when young, light brown or pink; later they become covered with powder except a thin streak down the center of the back. Along each side of the abdomen and dorsally placed may be found a row of black dots, one to each segment. The first and largest are found on the prothoracic segment, the others growing smaller toward the end of the body. Below these and on the side may be found still another row of dots. As the aphids grow larger the spots become hidden under a fine white or pinkish pruinose covering. This powder with the brown body of the insect gives a decided pinkish appearance. Other stages or forms are dark brown mottledwith black.

The body is exceedingly robust and globose. The antennae reach to about the second pair of legs and both legs and antennae are set with fine short hairs. The third and fourth antennal segments appear to be without sensoria; the fifth and sixth segments bear one each. The nectaries are broad and rounded without much depth. The cauda is broadly rounded.

Measurements: Length of body 3.55 mm.; width, 2 mm. Length of antennal segments: III, 0.44 mm.; IV, 0.135 mm.; V, 0.22 mm.; VI, and spur, 0.135 mm. Length of hind tibia, 1.51 mm.; length of hind tarsus, 0.27 mm.; hind metatarsus, 0.09 mm.; length of beak, 1.74 mm.

Alate viviparous female: General color: head nearly black, thorax dark brown, abdomen light brown mottled with dark brown to black splotches, body more or less pruinose. Antennae and legs light at the base and dark toward the ends. The former are somewhat stout and reach to the base of the metathorax; the third segment bears 5 to 7 large sensoria (sometimes less); the fourth, one or two; and the fifth, one large one at the distal end. The wings are long and wide with the median vein three branched. The stigma is long and narrow. Beak slender and sharp, reaching to within a short distance of the base of the cauda. Nectaries broad, cone-shaped and of medium thickness. Cauda broadly rounded.

Measurements: Length of abdomen, 2.9 mm.; width, 1.45 mm. Length of antennal segments: III, 0.4 mm.; IV, 0.176 mm.; V, 0.23 mm.; VI and spur, 0.154 mm. Length of wing, 3.8 mm.; width, 1.3 mm.; length of hind tibia, 1.9 mm.; length of hind tarsus, 0.242 mm.; length of hind metatarsus, 0.09 mm.; length of beak, 1.9 mm.

Lachnus parvus new species (Plate XI, figs. 1 to 7.)

Collected at Washington, D. C., July 4, September 15 and October 21, 1909. This species is quite distinct from all others collected by myself in the vicinity of Washington in that it is

covered with very fine waxy threads, and was found in rows along the needles of *Pinus virginiana* and *Pinus rigida*. This species was taken while collecting with Prof. C. P. Gillette, who has already indicated the species in the *Journal of Economic Entomology*, II, p. 385, 1909. This is the smallest species of this group known to me.

General color beneath the waxy threads, brownish tinged with green. These waxy threads are also spread about over the needles causing them to appear as if covered with a bluish powder. No other color notes were taken.

Apterous viviparous female: Body more robust than that of the alate form, antennae reaching to the third pair of coxae and the beak reaching to the second pair. Beak broad and blunt at the tip. Legs and antennae with numerous long and slender hairs. Third and fourth antennal segments apparently without sensoria, fifth and sixth segments with one each. Nectaries small and cone-shaped with a slight inclination to bell-shaped. The opening rather large for the base. Cauda bluntly angled.

Measurements: Length of body, 1.7 mm.; width, 0.84 mm. Length of antennal segments: III, 0.32 mm.; IV, 0.135 mm.; V, 0.14 mm.; VI and spur, 0.12 mm. Length of hind tibia, 0.94 mm.; length of hind tarsus, 0.33 mm.; length of hind metatarsus, 0.066 mm. Length of beak, 0.44 mm.

Alate males and ovoviparous females taken the last of October.

Alate viviparous female: Body elongate and slender, antennae and legs medium slender and thickly covered with long slender hairs. Antennae reaching to the third pair of coxae and the beak reaching to the second pair; beak broad and blunt at the tip. The third antennal segment bears about eight small sensoria; the fourth two and the fifth a single large one near the distal end; sixth with the usual large one near the base of the antennal spur. Wings hyaline and the median vein but a very indistinct single piece as indicated in the accompanying figure. Nectaries small and more or less bell-shaped. The opening rather large for the base. Cauda bluntly angled.

Measurements: Length of body, 1.48 mm.; width, 0.6 mm. Length of antennal segments: III, 0.32 mm.; IV, 0.154 mm.; V, 0.176 mm.; VI and spur 0.154 mm. Length of wing, 2.5 mm.; length of hind tibia, 0.92 mm.; length of hind tarsus, 0.3 mm.; length of hind metatarsus, 0.066 mm.; length of beak, 0.49 mm.

The writer is making an attempt to prepare a contribution toward a monograph of the *Lachninae*, and would appreciate receiving material from all sections of the world. Specimens may be mounted on slides but specimens in 70% alcohol are preferred. In either case, include such color notes as are obtainable. If specimens are sent in alcohol, put a small amount of cotton in the vial and push down until the material is held firmly

against the bottom; otherwise the specimens may lose their appendages. Credit will be given in all cases.

Note.—In the June, 1914, number of the *Entomological News*, an aphis from sugar cane was described as new by myself. Mr. T. E. Holloway, of the U. S. Bureau of Entomology, should have received credit for collecting the specimens.

EXPLANATION OF PLATES

Plate V

Fig. 1.—*Prociphilus fraxini-dipetalae* Essig. Antenna and wings of spring migrant from ash.

Fig. 2.—*Prociphilus fraxini-dipetalae* Essig. Antenna and wings of fall migrant from Douglas fir.

Plate VI

Microsiphum canadensis Williams, alate viviparous female: fig. 1, antenna; fig. 2, third antennal segment (much enlarged); fig. 4, nectary (enlarged); fig. 5, cauda. Apterous viviparous female: fig. 3, third antennal segment (much enlarged); fig. 6, specialized setae on frons; figs. 7, setae on body.

Microsiphum artemesiae Gillette, alate viviparous female: fig. 8, antenna; fig. 9, third antennal segment (much enlarged), Colo. specimens; fig. 13, do., Oregon specimens; fig. 11, nectary; fig. 12, setae; fig. 15, frons; fig. 16, cauda. Apterous viviparous female: fig. 10, third antennal segment, Colorado specimens; fig. 14, do., Oregon specimens.

Microsiphum oregonensis new species ?, apterous viviparous female: fig. 17, antenna; fig. 18, third segment (much enlarged); fig. 19, two views of body setae; fig. 20, frons; fig. 21, portion of abdomen showing nectaries and cauda.

Chaitophorus tridentatae new species, alate viviparous female: fig. 22, head with antenna and a diagrammatic sketch of the arrangement of the specialized setae; fig. 23, nectary; fig. 24, specialized seta (much enlarged); fig. 25, cauda.

Plate VII

Aphis reticulata new species, alate viviparous female: fig. 1, antenna; fig. 2, third antennal segment (much enlarged); fig. 5, nectary; fig. 6, cauda. Apterous viviparous female: fig. 3, prothoracic tubercle; fig. 4, nectary; fig. 7, reticulations on body.

Aphis oregonensis new species, alate viviparous female: fig. 8, antenna; fig. 9, third antennal segment (much enlarged); fig. 10, tubercles on abdomen between cauda and nectaries; fig. 12, cauda; fig. 14, prothoracic tubercle; fig. 16, nectary. Apterous viviparous female: fig. 11, abdominal tubercles between cauda and nectaries; fig. 13, cauda; fig. 15, prothoracic tubercle; fig. 17, nectary.

Aphis hermistonii new species, alate viviparous female: fig. 18, antenna; fig. 19, third antennal segment (much enlarged); fig. 20, prothoracic tubercles; fig. 21, nectary; fig. 23, cauda. Apterous viviparous female: fig. 22, nectary; fig. 24, cauda; fig. 25, tubercles along the side of the abdomen.

Aphis tridentatae new species, alate viviparous female: fig. 26, antenna; fig. 27, specialized seta; fig. 28, frons; fig. 29, cauda; fig. 30, nectary.

Plate VIII

Macrosiphum ludovicianae Oestlund, alate viviparous female: fig. 1, antenna; fig. 2, third antennal segment (much enlarged); fig. 4, nectary; fig. 5, cauda. Apterous viviparous female: fig. 3, third antennal segment (much enlarged).

Macrosiphum artemesiae Boyer, alate viviparous female: fig. 6, antenna; fig. 7, third antennal segment much enlarged and showing specialized setae; fig. 8, nectary; fig. 10, cauda. Apterous viviparous female: fig. 9, third antennal segment (much enlarged).

Macrosiphum artemesicola Williams, alate viviparous female: fig. 11, antenna; fig. 12, nectary; fig. 13, frons; fig. 14, specialized setae; fig. 15, cauda.

Aphis artemesicola Williams, apterous viviparous female: fig. 16, antenna; fig. 17, third antennal segment (much enlarged); fig. 18, nectary; fig. 19, cauda.

Aphis frigidae Oestlund, apterous viviparous female: fig. 20, antenna; fig. 21, nectary; fig. 22, frons; fig. 23, specialized seta; fig. 24, cauda.

Plate IX

Amphorophora subterrans new species, alate viviparous female: fig. 1, antenna; fig. 2, nectary; fig. 4, cauda. Apterous viviparous female: fig. 3, third antennal segment.

Macrosiphum mentzeliae new species, alate viviparous female: fig. 5, antenna; fig. 6, nectary; fig. 8, cauda; fig. 9, capitate hair. Apterous viviparous female: fig. 7, third antennal segment.

Aphis lithospermi new species, alate viviparous female: fig. 10, antenna; fig. 11, nectary; fig. 12, cauda; fig. 14, abdominal tubercles. Apterous viviparous female: fig. 13, nectary.

Aphis chrysothamnii new species, alate viviparous female: fig. 15, antenna; fig. 16, nectary; fig. 17, cauda. Apterous viviparous female: fig. 18, nectary.

Macrosiphum pteridis new species, alate viviparous female: fig. 19a, antennae; fig. 19b, cauda; fig. 19c, nectary.

Plate X

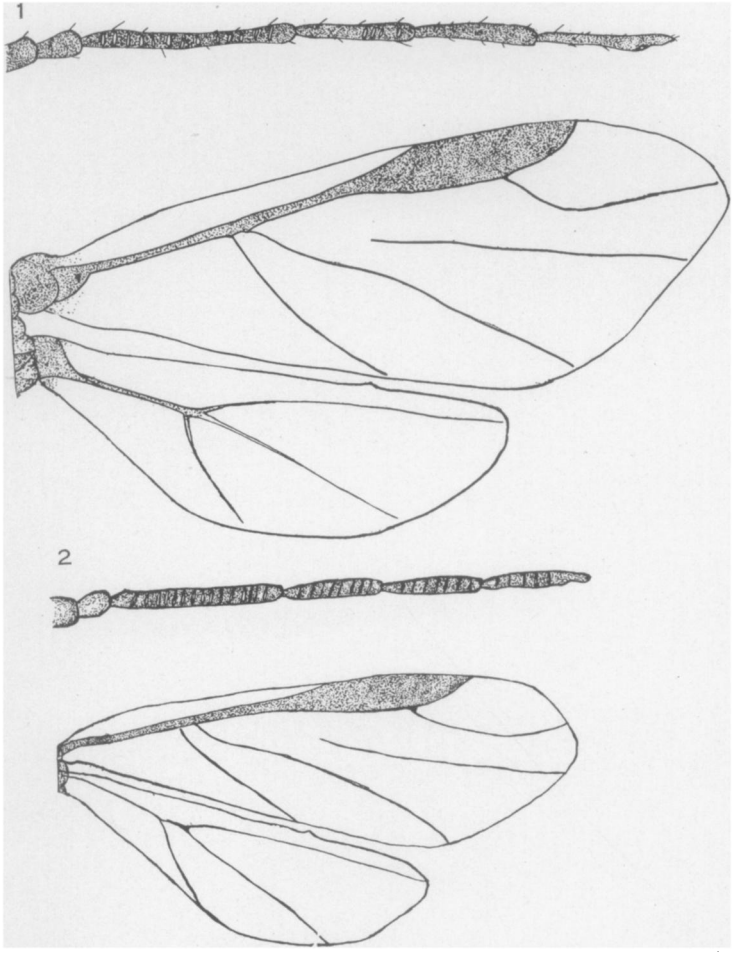
Lachnus oregonensis new species, alate viviparous female: fig. 1, wing; fig. 2, beak; fig. 3, hind leg; fig. 4, nectary; fig. 5, antenna; fig. 7, tip of abdomen; fig. 8, prothoracic segment. Apterous viviparous female: fig. 6, antenna.

Lachnus laricifoliae new species, alate viviparous female: fig. 9, wing; fig. 10, beak; fig. 11, hind leg; fig. 12, nectary; fig. 14, antenna. Apterous viviparous female: fig. 13, antenna.

Plate XI

Lachnus parvus new species, alate viviparous female: fig. 1, wing; fig. 2, hind leg; fig. 3, antenna; fig. 5, nectary; fig. 6, cauda; fig. 7, beak. Apterous viviparous female: fig. 4, antenna.

Lachnus rubicundus new species, alate viviparous female: fig. 8, wing; fig. 9, hind leg; fig. 10, antenna; fig. 12, nectary; fig. 13, cauda; fig.14, beak. Apterous viviparous female: fig. 11, antenna.



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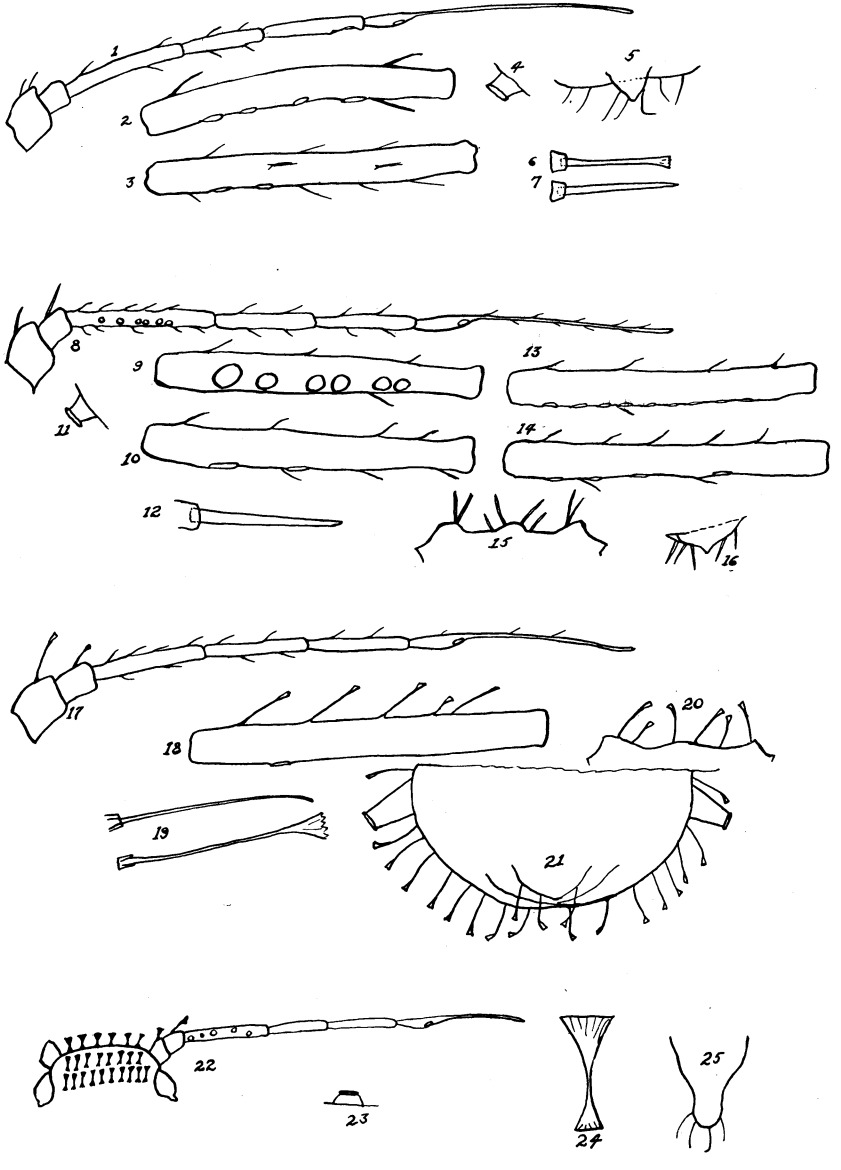
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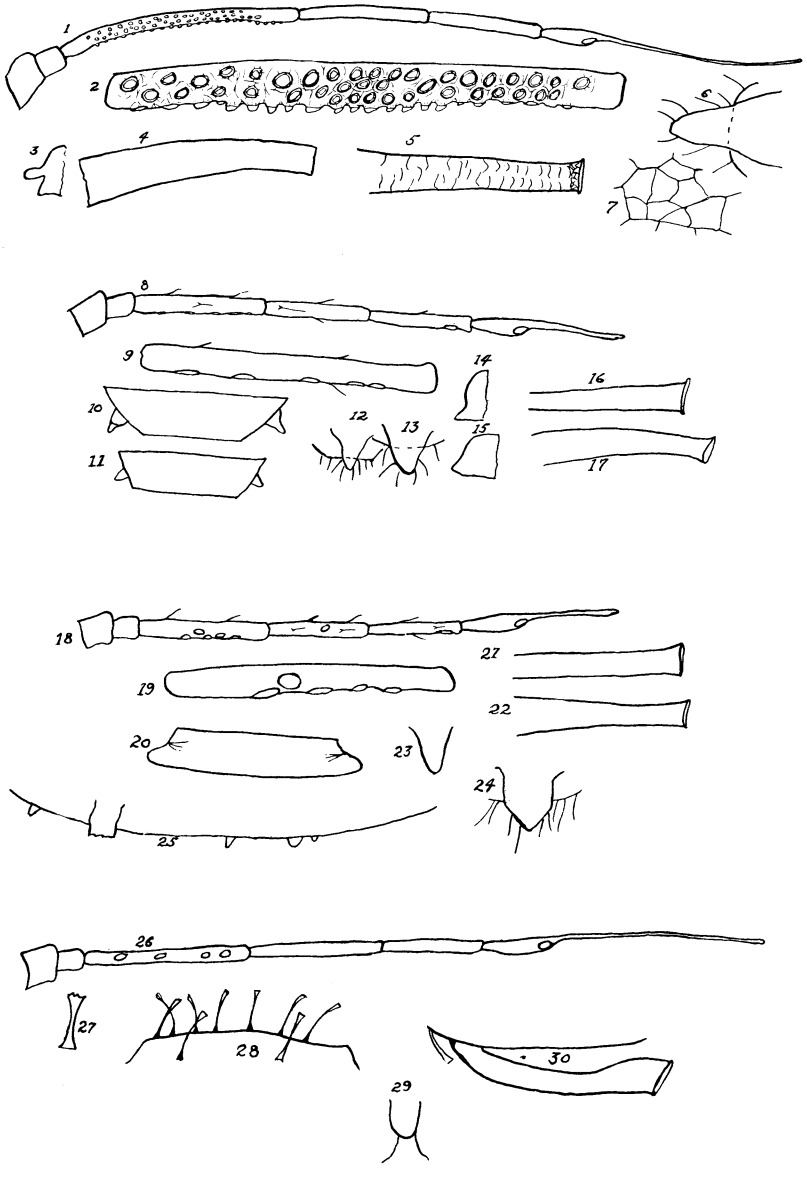
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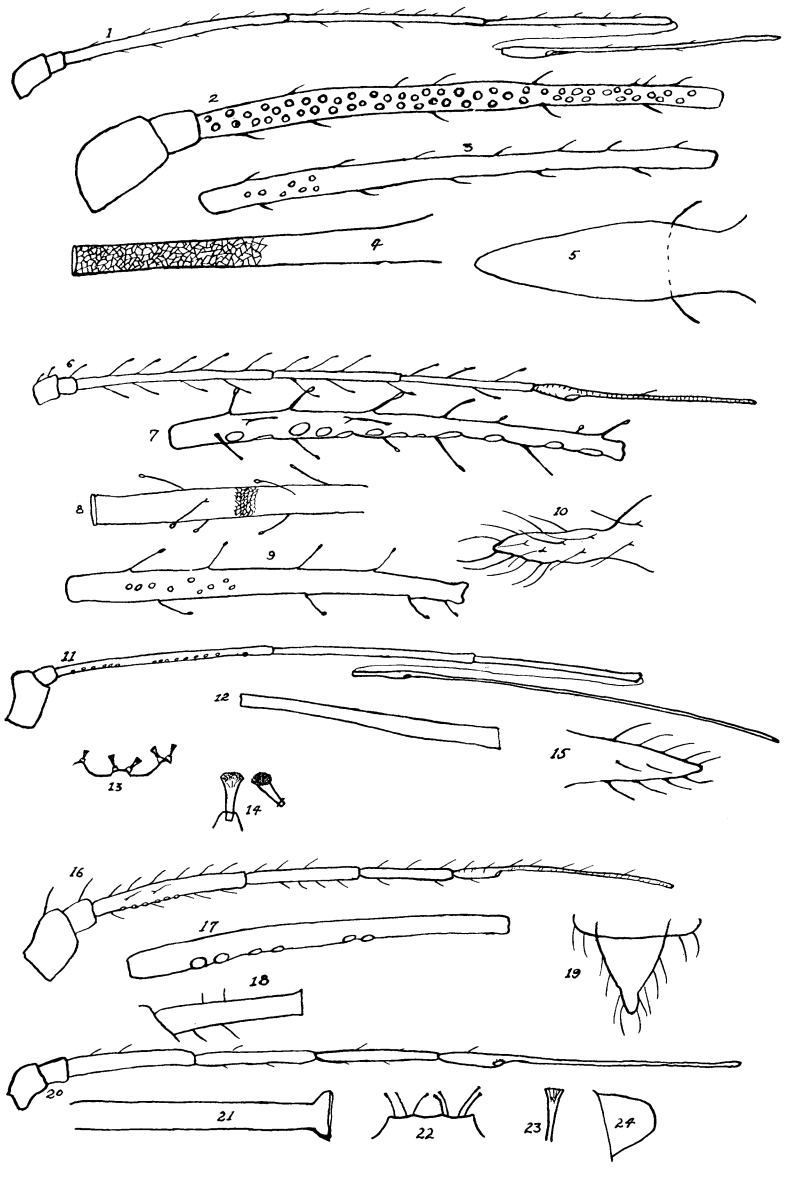
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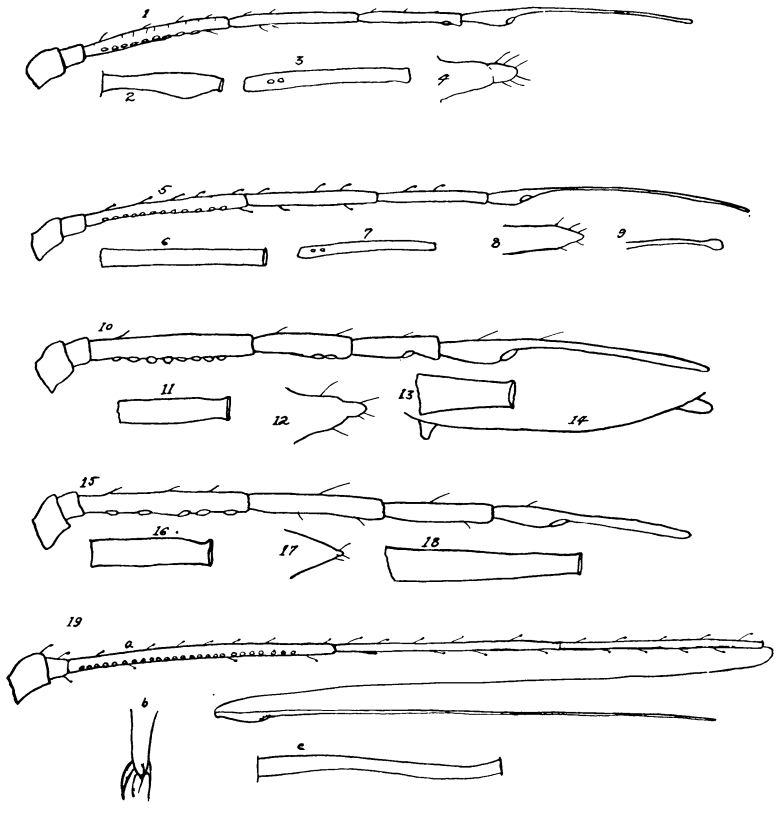

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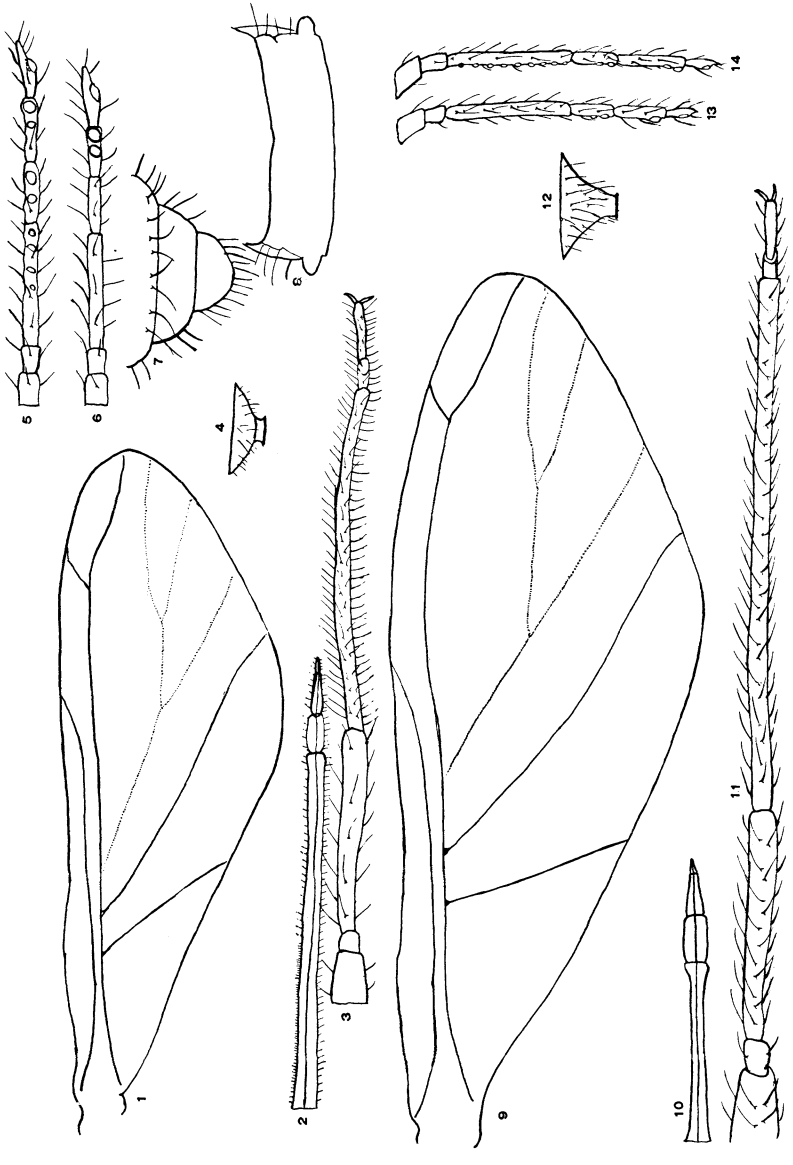
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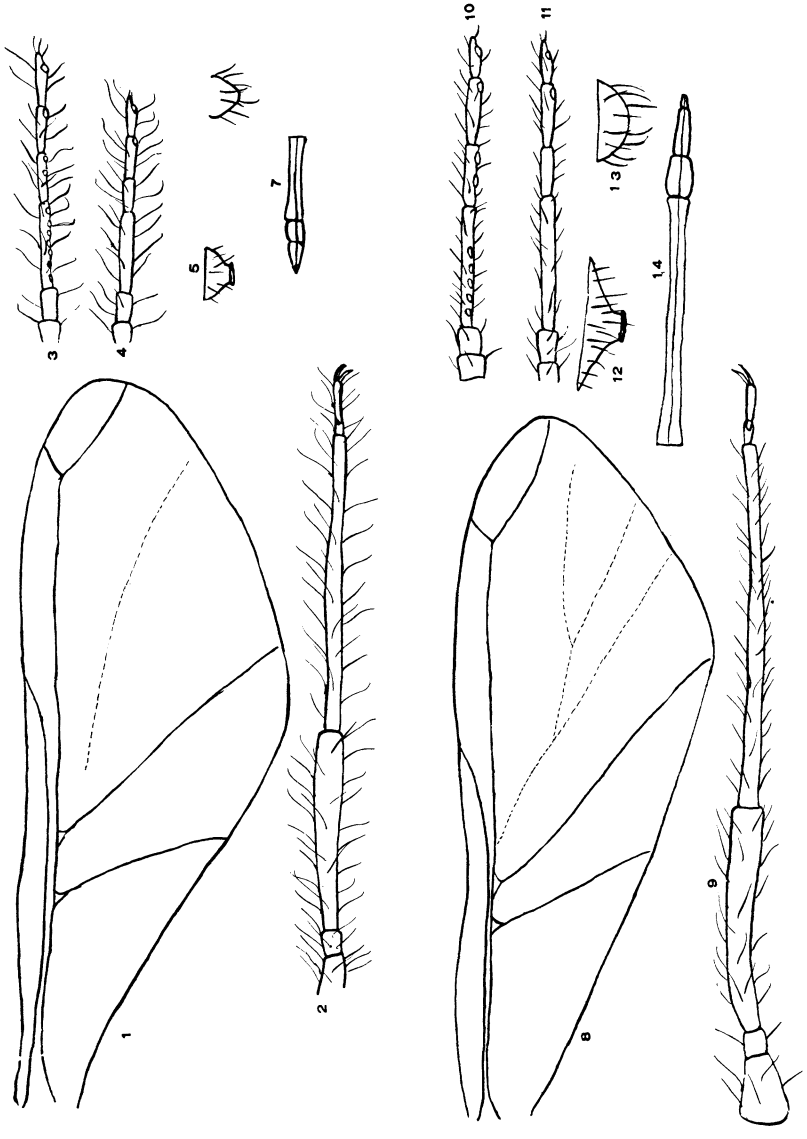
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